



Restoration, rehabilitation and sustainable livelihoods: the importance of alternative incomes for tropical peatland-dependent communities

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Summary

The restoration of tropical peatlands is unlikely to succeed without strong support from and engagement with local communities. In the absence of alternative income earning opportunities, populations whose livelihoods currently depend on the exploitation of peatlands may destroy restoration efforts that they perceive not to be in their interest. Focusing on agriculture and community-based forest management in Indonesia, this paper will examine a range of strategies for promoting alternative livelihoods that have potential for meeting local needs as well as wider tropical peatland restoration and 'wise use' goals.

Key index words: tropical peatland, restoration, communities, forests.

Introduction

This paper argues that for restoration measures to succeed on tropical peatlands, they must be conducted in collaboration with local communities. This is because communities who currently depend upon peatlands for meeting their livelihood needs may destroy restoration efforts that they perceive not to be in their interests. Examples of how they may do this include illegal forest felling, the use of fire to promote agriculture in degraded forests, or the destruction of dams designed to slow peatland drainage. Significant and appropriate incentives are therefore needed to persuade local communities to substitute peat degradation-based income earning strategies with alternative livelihood opportunities that have limited impacts on tropical peat ecology and hydrology.

Sustainable agriculture on tropical peat?

Agriculture is difficult on tropical peat owing to the nutrient deficient and highly acidic nature of the soils. But as many people already live (or have been settled) on peatlands, it makes sense to use 'wise use' principles to minimize the impacts of peatland agriculture and raise its economic value to help prevent 'the misuse of these areas by burning caused by careless use of fire' (Silpola: 2007: 4). In this regard, district-based land zoning approaches would be valuable for identifying areas where cultivation is most likely to succeed and least likely to cause further environmental damage (Rieley & Page, 2005). Using existing data on landuse, vegetation, drainage status, peat thickness, substrate type, water table depth, available infrastructure, flooding regimes and so on appropriate cropping systems could be identified for discussion and participatory experimentation with farmers who have difficulty cultivating peatland soil.

Depending on subsistence needs and the proximity of local markets for cash crops, examples could include rice on peat less than 1 m thick; maize, soybean, groundnut, cassava, rambutan, oil palm or coffee on 1-1.5 m thick peat and perennial crops such as coconut or pineapple on 1-2 m thick peat (Rieley & Page, 2005).

Community-Based Forest Management (CBFM)

Given the Indonesian government's current emphases on both social forestry and the need to rehabilitate state forests (Nawir *et al.*, 2007), it is a good time to investigate the potential of CBFM to address the twin goals of tropical peatland restoration and alternative income generation for peatland-dependent communities.

Opportunities for CBFM in Indonesia

According to an international study by Angelsen and Wunder (2003) three main types of CBFM have significant potential for poverty alleviation. The first involves increased local control over and formalized benefits from natural (often state) forests and can have important benefits to local communities so long as tenure is secure and benefit-sharing arrangements are clearly understood (Kerr *et al.*, 2006; Nawir *et al.*, 2007). Formal rights to collect specified types of non-timber forest products (NTFPs), fuel wood and timber from local forests can be an important incentive to participate in CBFM while incomes from tending tree nurseries, clearing land and planting trees are also popular with many local communities. In areas with a high level of dependence on fuel wood for cooking, CBFM schemes could investigate opportunities for providing alternative household energy sources such as small biogas plants fed by kitchen waste and/or animal manure.



As around 2.5 million ha of Indonesia's peat swamp forest is situated within National Parks, Game Resource Areas and Nature Reserves, the development of ecotourism could be a possible income-earning strategy for local communities. A community-based forest rehabilitation scheme in Meru Betiri National Park, for example, was very successful in reforesting degraded areas, improving forest ecological functions and raising local incomes (Nawir *et al.*, 2007). Similar participatory initiatives involving replanting and rehabilitation activities (such as blocking drainage canals), the construction of ecotourism facilities (such as tree walks or wildlife viewing stations) and the processing and sale of NTFPs could be pursued if funding could be secured.

The second initiative involves smallholder tree growing projects on private or community land and may be appropriate on the degraded peat of the ex-Mega Rice Project where there is an urgent need to increase land productivity and reduce the risk of fire. Possible avenues to explore with local communities include the socio-economic and ecological suitability of perennial crops such as rambutan, coffee, coconut, aloe vera and pineapple that tolerate peat soils and high water tables thus promoting restoration. Peat-friendly agribusiness involving peat tolerant crops that can easily be processed and marketed by local people also offer opportunities for income diversification. Promising examples include *nilam* (*Pogostemon sp.*) for perfume oil production, *kumis kucing* (*Orthosiphon sp.*) for medicinal use, tomatoes for ketchup and *bungamasalan* flowers; some of which have markets well beyond the production area. Oil palm may also be a suitable option for revegetating degraded peat and helping to protect it from fire and carbon loss (Limin *et al.*, 2003).

The third initiative involves income generation from small-scale, wood-based enterprises and could be important for communities living on degraded peat or undertaking CBFM in peat swamp forests. Tree species that grow well on peat and can easily be processed by local communities include rubber (*Hevea brasiliensis*) and *Acacia mangium*, although a mixture of indigenous and exotic species with different growth rates are good for meeting future demand for 'hard wood chips, sawn timber, veneers, medium-density board and oriented-strand boards' (Rieley and Page, 2005: 86). Assistance from the state in the form of soft loans to provide start-up capital plus training and extension to deliver business skills and knowledge of market networks is very important in helping local communities to set such enterprises up.

Limitations of CBFM in Indonesia

Although CBFM coupled with agribusiness and small-scale forest-based enterprises would appear to offer some promising restoration opportunities, certain limitations must be considered. Firstly, there are limits to the degree of poverty alleviation that can be provided from CBFM without some degree of commercial forestry, so ecological/livelihood trade-offs may have to be made. Secondly, it is important not to over-romanticize the desire or ability of local communities to be involved in CBFM

(Jewitt, 2002) as they may be far more interested in logging forests or converting them for agricultural purposes than in rehabilitating them. The following sections will offer some practical suggestions to overcome these limitations and make the most of CBFM as a means of promoting tropical peatland restoration.

Important criteria for successful CBFM in Indonesia

As for sustainable agriculture on peatland, one of the foremost suggestions for successful CBFM would be to use district based land zoning approaches to target the most suitable areas. Initiatives are already afoot to coordinate Indonesia's Master Plan for Forest and Land Rehabilitation with a view to synergizing forest and land-use management planning (Nawir *et al.*, 2007). Master plan data could be combined with data on causes of deforestation, peat thickness, substrate type, water table depth, existing drainage canals, population density and socio-economic data on neighbouring communities to identify the most suitable areas and communities for CBFM and reforestation of degraded private/community land. When identifying peatland restoration strategies, it is also important to consider factors such as the socio-cultural and subsistence-related importance of forests to local people and their history of (or interest in) community-forest management (Jewitt, 2002). In isolated areas where population density is low, CBFM plus natural regeneration could be a suitable option while in more densely populated areas with accessible markets, a more integrated strategy focusing on the development of agribusiness or forest produce-based enterprises might be more appropriate (Nawir *et al.*, 2007).

Once promising communities are identified, it is important to conduct an intensive period of participatory appraisal to investigate local people's livelihood portfolios, chart existing peatland uses and determine existing land/forest ownership and access rights. It is also important to explore the underlying causes of peatland deforestation/degradation as these are likely to act as continuing disturbances if unaddressed. Wealth ranking can be carried out to establish intra-community wealth variations and identify marginal and/or vulnerable groups whose preoccupation with daily subsistence and lack of time and money might prevent them from being involved in restoration projects. Discussions can then focus on how to tailor projects to minimize harm and maximize benefits to such groups, thus reducing the danger of exacerbating their marginal status. As a common feature of CBFM is for men to dominate decision-making while women are either excluded from, or feel socially restricted from attending CBFM meetings (Jewitt, 2002), gender analysis techniques are useful for identifying gender divisions of labour and variations in natural resource access, use and management.

Participatory mapping techniques are helpful for identifying different land uses, highlighting the role of different peat ecosystems in supplying local subsistence and cash requirements and pinpointing problem areas (waterlogged, drought prone, high fire risk, pyretic substrate, etc). Similar methods can also be used to produce



rehabilitation and/or landuse planning maps based on community consensus regarding areas to be reforested, suitable species to be planted and so on while matrix ranking can be a useful tool to establish tree species and agricultural crop preferences for different stakeholder and gender groups. A local organization or NGO can be extremely valuable for helping to empower the community's institutional and technical capacities to support the rehabilitation programme and facilitate multi-stakeholder analyses at various stages of the program.

A detailed analysis of intra-community livelihood priorities can be very important for identifying appropriate income-generating strategies and restoration activities as program incentives must be closely linked to local requirements. Clear economic incentives are needed to stimulate a high level of community participation (Nawir *et al.*, 2007), so participatory financial analyses conducted prior to the start of the project with different socio-economic groups are helpful for designing suitable incentives for long term participation. The most common economic incentive associated with CBFM is income from employment associated with tree planting and land preparation which can be expanded by making longer-term payments for tree maintenance (based on survival rates). Where benefit sharing mechanisms are to be used, a range of different possibilities should be discussed with all stakeholders to ensure appropriateness, transparency, equity and fairness. The most widespread mechanism is for communities to receive a pre-agreed share of the value of any timber trees that they plant and protect but, as this forces participating communities to calculate and act over extended temporal horizons, projects should also offer a range of income and asset generating activities that produce a quick return. Examples could include training and support for small-scale food processing activities, the marketing of herbal medicines, goat and poultry breeding or the provision of small-scale biogas plants.

Funding mechanisms for peatland restoration

To achieve the twin goals of tropical peatland restoration and alternative income generation, additional funding sources are needed to supplement what is available from existing government forest rehabilitation budgets. Payment for ecological services (PES) and carbon credit schemes have a lot of potential in this regard but are largely still untested.

Payment for Ecological Services (PES)

PES initiatives offer important opportunities to compensate local communities for providing environmental services such as carbon sequestration/storage, biodiversity conservation and watershed protection (Wunder, 2005) and are particularly relevant for tropical peatlands which act as important global carbon stores as well as having important drainage and water control functions. PES is based on direct, conditional payments to local land users for 'adopting practices that secure ecosystem conservation and restoration' (Nawir *et al.*, 2007: 193) and can reduce rural poverty by offering additional incomes to communities willing to be involved in forest/watershed protection.

Community-based peatland restoration lends itself well to PES payments if suitable 'buyers' can be found. Where this proves difficult, initiatives that reward people for environmental services (RES) may be an alternative means of linking benefits such as enhanced tenure security to resource protection and landuse agreements (Kerr *et al.*, 2006).

Carbon credit funding for peatland restoration

'Avoided deforestation' (AD) schemes in the voluntary carbon markets sector and new 'Reducing Emissions from Deforestation and Forest Degradation' (REDD) initiatives offer significant incentives for protecting carbon stocks in natural forests and may have important pro-poor benefits if suitably targeted. Tropical peat is a good candidates for REDD in terms of preventing further emissions from drainage and fire.

Biorights

Another source of funding that could be tailored more specifically to the restoration of tropical peatlands and the provision of alternative livelihoods for their residents is the 'biorights' approach established by Wetlands International (WI). This involves the 'establishment of business contracts, providing micro-credit for sustainable development, in exchange for the conservation or rehabilitation of globally important biodiversity or environmental values' (Silvius and Diemont, 2007: 35). Biorights schemes implemented by WI are currently operating in the buffer zones of the Berbak National Park in Sumatra. The scheme also has potential to pay local communities to build dams and block logging canals (to preserve peatland hydrology and biodiversity) and be involved in community-based fire prevention (Limin *et al.*, 2003).

Conclusion

For global concerns regarding carbon emissions to result in sustained action on the ground by resource poor communities whose priorities reflect daily subsistence needs, significant economic incentives are needed. Mechanisms such as PES, REDD and biorights offer important opportunities but for these to make headway in terms of either tropical peatland restoration or the provision of alternative local livelihoods, they have to be highly flexible and responsive to local needs. At present, there is much uncertainty about the willingness of buyers to invest in community-based peatland restoration and the degree to which poor people can take advantage of these emerging markets. Unless these issues can be resolved, the future is likely to be very problematic for tropical peatlands.

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